

## National Research Data Infrastructure for Earth System Sciences

2<sup>nd</sup> DFG NFDI Conference 2020 – Lars Bernard (TU Dresden) for the NFDI4Earth Consortium

## **Our domain - Earth System Science**

Earth System Science (ESS)

Atmosphere, Biosphere, Cryosphere, Geosphere, Hydrosphere, and Anthroposphere

Research from Local Processes to Global Challenges

e.g. climate change, environmental pollution, land-use change, natural hazards, scarcity of raw materials, water scarcity

- Observing, measuring, modelling, analyzing, predicting the Earth System
- In international and interdisciplinary settings
- Spatio-Temporal Data as common reference

FAIR Data and Interoperable Tools to enable new level of synthesis





#### Who we are

- Currently 54 partners from:
  - Universities
  - Research Organisations Helmholtz, Leibniz, Max Planck Society
  - Infrastructure Providers
     Research Infrastructures, Repositories, High Performance Computing Centers, Libraries
  - Governmental Institutions
  - Scientific Associations
- Established 2018 the NFDI4Earth as an **Open Consortium**





#### What we have

- Positive attitude to Openness and FAIRness
- Data from different sources, growing openness
- Established repositories PIDs, curation, ...
- Several standards for interoperability Metadata, Data Schemas, APIs, Spatio-temporal reference systems, Vocabularies/Ontologies
- Demanding models and big data applications
   too big for local processing
- Collaborative development of simulation and analysis tools - typically as **Open Source**



#### **Our Issues**



- Large, diverse number of data services (> 100) and activities related to ESS...
- **Different data qualities**: dimensions, semantics, scale, coverage, temporal and spatial resolutions, sizes, repeatability, provenances, curation levels,...
- Incomplete support along the data lifecycle
- Lack of support (platforms, tools) for joint and collaborative interpretation of multiple heterogeneous and decentralized data
- The typical ones
  - Hardly sustainable offers, operation and knowledge management related to RDM
  - Different data cultures within sub-disciplines and organizations...RDM experts and novices...need for recognition

# **Our Challenges**



#### Large, diverse number of data services (> 100) and activities

- One Community approach to Openness and FAIRness in Earth System Science
- Innovative Platforms for
  - integration of multiple heterogeneous and decentralized data streams
  - collaborative data analysis



- Qualification for people, data, tools and services
- Consolidation as a basis for sustainability

## **NFDI4Earth - Strategy**

TA1: 2Participate Pilots, Incubators, Training and Academies

#### TA2: 2Facilitate

Virtual Help Desk; N4E One Stop; N4E Data Science Tools, Governmental Data; Long Term Preservation

#### TA3: 2Interoperate

N4EArchitecture; Gold Standards for FAIR ESS; NFDI Commons; National & International Networks

#### TA4: 2Coordinate

Collaborative & Sustainable Governance; Communication; Community Support



**Innovation Perspective** 

**Community Perspective** 

**User Perspective** 

#### **Infrastructure Perspective**

**NFDI Integration** 

Coordination and Community Support

#### **Our Expectations towards NFDI**



#### https://doi.org/10.5281/zenodo.3457213

June 15, 2020	Other Open Access
Leipzig-Berlin-Erklärı	ung zu NFDI-
Querschnittsthemen	1 der
Infrastrukturentwick	dung
<ul> <li>Maik Bierwirth;</li> <li>Frank Oliver Glöckner;</li> <li>Christ</li> <li>Andreas Degkwitz;</li> <li>Oliver Koepler;</li> <li>Heike Net</li> </ul>	stian Grimm; () Sonja Schimmler; Franziska Boehm; () Christian Busse; euroth
Für den wissenschaftsgeleiteten Aufbau der Nationz	alen Forschungsdaten-Infrastruktur (NFDI) muss sich die Infrastruktur
gemeinsam mit der Forschung weiterentwickeln. Die	e dafür notwendigen, wechselseitigen Abstimmnungen müssen auf
Basis tragfähiger Prozesse und Strukturen sicherges	stellt werden. Themen, die für mehrere Fachkonsortien relevant sind,
müssen im Sinne einer nachhaltigen Funktionalität k	kooperativ und über einzehne Konsortien hinweg bearbeitet werden.
Dieses Dokument identifiziert solche Querschnittsth	nemen und Wege zu ihrer Bearbeitung in der NFDI.
Um diese Herausforderung abgestimmt zu adressie	eren, hat sich die Mehrzahl der Fachkonsortien im Sommer 2019 auf die
"Berlin Declaration on NFDI Cross-Cutting Topics" ver	erständigt. Auf einer gemeinsamen Veranstaltung am 25. Februar 2020
in Berlin haben sich Vertreterinnen und Vertreter von	n Fachkonsortien und Querschnittsinistiever enere über die
Handlungsfelder der NFDi-Übergreifenden Infrastruk	kurentwicklung ausgetauscht. Dabei haben Fachkonsortien und
Querschnittsinitiativen vier modellhafte Vorschläge -	erarbeitet, um diese Handlungsfelder zu erweitern und im Rahmen der
NFDI belastber und nachhaltig umzusetzen. Diese J.	Leipzig-Berlin-Frikking zu XPI-Duerschnittsthemen der
Infrastrukturentwicklung" dient als Diskussionsimpu	uls und richtet sich an alle Konsortien und am Aufbau der NFDI

- The "NFDI Verein" as the Common Platform
- Jointly tackling Cross-Cutting Topics
  - Collaborative governance and general framework (e.g. common vision)
  - Community (User) Involvement (e.g. cross-NFDI use cases)
  - Common technical infrastructure and concepts (e.g. research data commons, pIDs...)
  - Legal and ethical aspects

#### **NFDI4Earth Contributions to NFDI**



- NFDI4Earth plans dedicated measures to contribute to NFDI commons
- NFDI4Earth specific NFDI contributions:
  - Knowledge hub for dealing with geo-spatio-temporal data
  - Long-standing active participation in various relevant international networks (AGU, EGU, RDA, EOSC,...WMO...)
  - Collaboration with governmental agencies and other national stakeholders
  - Widespread experiences in contributing to international standards for geodata and services (Metadata, Data Encodings, APIs)
  - Well-established culture and skills concerning community software developments
  - Representing a number of the German HPC centres contributing to the envisioned scientific computing cloud



# Thank You !



https://www.nfdi4earth.de/